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ABSTRACT

This is the fourth report of the evaluation of the French-Hebrew immersion programs at the Hebrew Foundation School and the Solomon Schecter Academy in Montreal. Students in the study were those who had started in the project in kindergarten and grade 1, and, at the time of the fourth evaluation, were in grades 3 and 5 respectively. Two pilot immersion groups and one comparison group were considered. The purpose of the current evaluation was to continue monitoring the development of the pilot immersion groups as they completed grades 3 and 5, in the areas of English, French, Hebrew, and mathematics. Particular attention is paid to the performance of the immersion groups in grade 3. For the third grade, results indicate that immersion students have superior skill in French and parity in English skills with their peers in the control school. There was no evidence that participation in French immersion had adverse effects on the students' Hebrew language development. Results were similar for fifth grade students, and in addition, there was no evidence that the mathematics achievement of the immersion students in fifth grade was adversely affected by participation in the program. (CLK)

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AN EXPERIMENT IN TRILINGUAL EDUCATION

- REPORT 4 -

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This is the fourth report of the evaluation of the French-Hebrew immersion programs at Hebrew Foundation School and Solomon Schecter Academy, including the Kensington Avenue branch. Students in grades 3 and 5 were included in the current evaluation. The grade 5 class at Kensington represents the pilot immersion group for that program which will be referred to as Immersion School 1 (IS1). The grade 3 class at Hebrew Foundation School represents the pilot immersion group for that program which will be referred to as Immersion School 2 (IS2). The grade 3 and 5 classes from the main branch of Solomon Schecter Academy were used as comparison groups and will be referred to as the Comparison School (CS).

In the first two evaluations (Genesee, Sheiner, Tucker & Lambert, 1974; Genesee, Lambert & Tucker, 1975), it was found that the pilot class at IS1, which was in grades 2 and 3 for the first

September, 1977

and second evaluations respectively, performed significantly better than the two other school groups, especially CS, on the French language tests. At the same time, there was no evidence that their achievement in English, Hebrew or Mathematics was impaired as a result of participation in the program.

The results of the two younger immersion groups at IS1 and IS2, which were in kindergarten and grade 1 during the first and second evaluations respectively, were more complicated. First, there was no evidence that by the end of grade 1 the IS1 and IS2 students had acquired superior proficiency than the CS students in the French language. And second, the results of the grade 1 mathematics tests were somewhat contradictory, with IS2 scoring lowest of all three groups on the English math test but highest on the French math test.

By the time of the third evaluation (c.f. Genesee, Tucker & Lambert, 1976), the pilot immersion groups had advanced to grades 2 and 4. In this evaluation it was found that the IS1 pilot immersion group, which was in grade 4, continued to perform significantly better than the two comparison grade 4 groups on the French language tests, including reading, speaking, listening, and rendement en Français and en mathématiques. These differences were particularly apparent between IS1 and CS; IS2 students, who had been following an enriched F.S.L. program since kindergarten, performed at the same level as IS1 students on some of the tests -- reading comprehension and several dimensions of the oral pro-

duction evaluation. At the same time, the English language and mathematics achievement scores of IS1 students were at par with those of their peers in the other two schools, with one major exception, vocabulary. In this case IS1 students were somewhat behind the other students. The Hebrew language proficiency of the IS1 students was as high as or somewhat better than, in two instances, that of the other two groups of students.

The results of the grade 2 testing revealed that there were no statistically significant differences between the two immersion groups, IS1 and IS2, and the control group, CS, on the French reading and listening comprehension tests. IS2 students, however, did perform significantly better on the Test de Rendement en Français and on French oral production than did CS students; for the most part, there were no differences between IS2 and IS1 on these measures. Thus, contrary to previous evaluations of these groups, IS2 was beginning to demonstrate superior proficiency in the French language relative to CS, while IS1 continued to perform at the same level as CS. The fact that IS1 did not score significantly lower than IS2, but at the same time did not score significantly higher than CS, suggests that the French program at CS is particularly strong thereby minimizing differences between its students and those attending the immersion program at IS1. It should also be recalled that the program at CS is an enriched F.S.L. program.

The English language skills of the grade 2 Immersion groups continued to develop so that there were no differences between them and CS on reading, and there were very small differences on word knowledge and word analysis skills. The largest difference was found in spelling. The Hebrew language skills of the grade 2 IS1 and IS2 students were at par with or better than those of CS students, thereby demonstrating no negative influence from the French component of the program. Finally, the mathematics achievement of IS1 did not differ from that of CS whereas IS2 scored lower than the two other groups. The differential in mathematics achievement seems to reflect a school effect rather than an immersion effect per se.

The purpose of the current evaluation was to continue monitoring the development of the pilot immersion groups as they completed grades 3 and 5 in the following skills areas -- English, French, Hebrew and mathematics. Particular attention will be paid to the performance of the younger Immersion groups, those in grade 3.

THE CLASSES

A summary of the class sizes is presented in Table 1A and a summary of the amount of classroom instruction in English, French and Hebrew is presented in Table 1B. The same groups of students have participated in three previous evaluations.

THE PROGRAMS

Grade 3

The English program at IS1 was devoted to English language arts; no content, such as mathematics or science, was being taught via English. All regular school subjects, along with French language arts, were taught in French. The Hebrew program was devoted to religious, cultural and language studies; Hebrew was used as the main medium of instruction during these lessons.

Grade 3 students at IS2 received no instruction in or via English. Thus, all regular subjects, along with French language arts, were taught in French. The Hebrew program was devoted to religious, and cultural studies with an emphasis on Hebrew as a modern language.

The English program at CS included instruction in English language arts and most other regular subjects, mathematics and science, etc. The French program included French language arts and Science Humaine, so that these students were receiving some content instruction via French, approximately 4 hours per week. The Hebrew program was essentially the same as that being offered in the Immersion branch at IS1.

Grade 5

The English program at IS1 included language arts and mathematics instruction. The French program included language arts and all other regular subjects, excluding math. The Hebrew program represented a continuation of the primary school program including religious and cultural studies with an emphasis on Hebrew as a modern language.

The English program at IS2 included language arts and all regular subjects. The French program included instruction in language arts. As in grade 3, the Hebrew program emphasized the religious and cultural importance of the Hebrew language and Hebrew as a modern language.

The English program at CS included language arts and all regular subjects. The French program was devoted only to language arts instruction. The Hebrew program was similar to that at IS1.

The teachers in each program were native speakers of their respective languages.

TEST BATTERY

(1) English Language Tests

The following English language tests were taken from the Metropolitan Achievement Tests (M.A.T.): Elementary, Form F, (1970) for grade 3, and the California Achievement Tests (C.A.T.): Level 3, Form A (1970) for grade 5. These are standardized group tests which assess a variety of language arts skills. Raw scores were used in the statistical analyses. Maximum possible scores for each test have been indicated in parentheses after the name of the test in the summary tables.

Vocabulary

Grade 3 students had to identify synonyms, antonyms, or word classification (Word Knowledge). Grade 5 students had to choose one word from four alternatives which had the same meaning as a target word presented in context (Vocabulary).

Reading Comprehension

Both grade 3 and 5 students were required to read a number of paragraphs and then answer multiple-choice questions about them. Questions cover the literal meanings of passages, drawing inferences from the material, identifying main ideas, and determining word meanings from context.

Language

The Language subtest for the grade 3 students consists of 50 items, 15 of which require the student to identify whether given sets of words are "telling" sentences, "asking" sentences, or not

sentences at all; and 35 items which require the student to identify errors in punctuation, capitalization, or usage in written material.

There were three separate language subtests for the grade 5 pupils -- Capitalization, Punctuation, and Usage and Structure. In the Capitalization subtest, the student is required to identify those words within a continuous text which need capitalization because of the nature of the word (e.g., proper nouns) or because of grammatical constraints (e.g., first word in a sentence). In the Punctuation subtest, the student is required to select or provide in the appropriate location, the correct punctuation for continuous text -- in Punctuation subtest 1, a letter, and in Punctuation subtest 2, a story. In the Usage and Structure subtest, the student's skills in the following areas are assessed: identification of correct standard English versus incorrect English; knowledge of complete versus incomplete sentences; ability to transform one sentence type into another (e.g., change a positive statement into a negative one); and knowledge of sentence elements and their functions (e.g., identification of a relative clause, an adjective, a conjunction).

Spelling

In the grade 3 spelling subtest the student is required to write a number of commonly used words dictated by the examiner. In the grade 5 spelling subtest, the student is required to select from among a group of four words the one, if any, which is misspelled.

Writing

Each grade 5 student was asked to write a composition based on one of three topic sentences provided by the examiner. The choice of topic sentence was left entirely to the student. The students were given 45 minutes to write the composition.

Each composition was later marked by two grade 5 teachers from the publish school system, working independently, along 9 dimensions -- 1) spelling, 2) sentence accuracy, 3) sentence complexity & variety, 4) organization, 5) originality, 6) overall, 7) length, 8) vocabulary, and 9) punctuation. On the first 6 dimensions, the ratings ranged from 5, indicating excellent performance for a grade 5 student, to 1, indicating totally inadequate performance for a grade 5 student. A rating of 3 indicates a level of performance to be expected of a grade 5 student. The compositions were graded in a random order and the raters did not know the school group of each author. The ratings for both raters were averaged to form a single score for each student on each dimension.

There were only two response categories for the length and and punctuation dimensions -- "appropriate" and "inappropriate". There were three categories for the vocabulary dimensions -- "superior", "average", and "below average". Scores are reported as ratios of the average total number of ratings in each category to the total number of ratings for each dimension. There was very high inter-rater reliability on all dimenisons of this evaluation.

(2) French Language Tests

Reading

The Test de Lecture: 3ième année (1976) was administered to the grade 3 students. This test was developed by the Ontario Institute for Studies in Education for use with grade 3 students in regular, total early immersion programs. The test consists of nine short passages followed by a number of four-alternative multiple-choice questions. Raw scores were analyzed.

A modified version of the Test de Lecture "California": 4è année (1967) was administered to the grade 5 students. This is a timed, group test developed for use with native French-speaking students. It consists of four subtests: (1) antonymes, (2) synonmes, (3) directives à suivre, and (4) interprétation des textes. For purposes of data anlysis the raw scores from subtests (1) and (2) were combined to form a single score, vocabulaire, and raw scores from subtests (3) and (4) were combined to form a single scores, compréhension. Raw scores were analyzed.

Test de Rendement en Français

This is a standardized group test devised by La Commission des Ecoles Catholiques de Montréal (C.E.C.M.). It consists of a number of multiple-choice questions assessing the following kinds of language skills: vocabulary, grammar, spelling, and logical inferencing. Norms, in the form of stanines, are established in November of each academic year when students at each grade level in the C.E.C.M. write this test. The grade 3 level was adminis-

tered to the grade 3 students and the grade 5 level was administered to the grade 5 students. In order that administration of this test to our students should coincide with administration of the test in the C.E.C.M., this test was given in November, 1976. Stanine scores were used in the statistical analyses.

Listening Comprehension

The listening comprehension tests were developed by the examiners. A different test was deivsed for each grade level -- both consisted of a short story followed by multiple-choice questions. The stories were read first in their entirety, without interruption; they were read a second time interjecting questions after each relevant section. There were three choices per question in both tests. The directions and story were presented by a male voice and the questions by a female voice. In order to standardize test administration, the tests were presented by means of a reel-to-reel tape recorder. Raw scores were analyzed statistically.

Oral Production

All students at both grade levels were interviewed individually for 5 to 10 minutes by one of two French-speaking interviewers. Conversation was initiated by first having the child describe a cartoon picture. The interviewer then engaged the child in a short conversation either about the cartoon or about other matters. The interviews were tape recorded for later analysis.

Each speech sample was subsequently rated subjectively and independently by two native francophones on five scales: listening comprehension, prononciation, vocabulaire, grammaire, and communication. The communication scale was intended to assess willingness to speak French. The ratings ranged from 5, indicating native-like or excellent performance, to 1, indicating very poor performance. The speech samples from all three schools were presented in a mixed random order to the raters; each grade level was analyzed separately but by the same evaluators. The raters were not aware of the language program of the speaker. The ratings of both raters were averaged to form one score for each student on each scale.

(3) Hebrew Language Tests

Reading

The grade 3 and 5 reading tests were devised by the heads of the Hebrew Departments at IS1 and IS2.

The grade 3 reading test consists of four subtests: Vocabulary, Verb Tense, Sentence Comprehension, and Paragraph Comprehension. In the Vocabulary subtest, the student is required to select from among four alternatives the one that means the opposite of a target word; maximum possible score is 17. In the Verb Tense subtest, the student is required to supply the correct verb form, in a sentence stem; the root verb was provided in parentheses. Knowledge of only the present and past tenses was necessary to supply the correct tense. There were two types of

errors: (1) use of the incorrect personal pronoun; and (2) use of the incorrect tense. Number of each error type was calculated in addition to number of correct responses. Maximum possible correct score was 10.

In the Sentence Comprehension subtest, the student is required to select from among three alternative words the one which completes the sentence stem. Maximum possible score is 15.

The Paragraph Comprehension subtest consists of two short stories from which a number of words had been deleted; there were 10 deletions from Story 1 and 12 deletions from Story 2. The student is required to fill in the missing words, all of which are provided in a random order at the bottom of the page. The student's score consists of the number of correct fill-ins for each story. The results for each story were analyzed separately.

The grade 5 reading test consists of three subtests: Vocabulary, Verb Tense and Comprehension. In the Vocabulary subtest, the student is required to select from among four alternatives the one which means the same as, or the opposite of, a target word. There are 10 synonym and 10 antonym items; each type of item is grouped accordingly. The student's score consists of the total number of correct responses for both parts of the subtest combined.

In the Verb Tense subtest, the student is required to provide the correct verb form in a sentence stem; verb roots were provided in parentheses. As in the case of the grade 3 Verb Tense

subtest, there are two types of errors: (1) use of incorrect personal pronoun; and (2) use of the incorrect tense. Maximum possible score is 20.

The Comprehension subtest consists of a story from which 23 words have been deleted. The student is required to supply the missing words; no alternatives are provided. Responses were classified according to four categories: omission, correct replacement, non-sense, or grammatical error. Two points were assigned if the student supplied the exact replacement or a perfectly acceptable synonym; one point was assigned if the student provided a synonym which was grammatically correct but semantically slightly deviant but acceptable in the context of the story. Fill-ins which made no sense in the context of the story, regardless of grammaticality, were classified as non-sense. Grammatical errors consisted of fill-ins which were semantically acceptable but grammatically unacceptable in the sentence frame. Maximum possible score on this subtest is 46.

Oral Production

The Hebrew oral production testing was carried out in the same way as the French oral production testing except that the interviewers and raters were native Hebrew speakers and the cartoon picture was different. All children were included in this assessment.

(4) Mathematics

Achievement in mathematics was assessed by means of English and French mathematics tests. The English mathematics test consisted of the mathematics subtests of the Metropolitan Achievement Tests for grade 3, and the California Achievement Tests for grade 5; the French mathematics test consisted of the Test de Rendement en Mathématiques.

English Tests

Grade 3

There were three subtests: (1) Computations, (2) Concepts, and (3) Problem Solving. The Computations subtest includes 40 items which assess the students' ability to carry out addition, subtraction, multiplication and division with integers, decimals and fractions. The Concepts subtest consists of 40 items which assess the students' understanding of a variety of mathematical principles and relationships, including laws and properties of number systems, measurement and geometry, place value, and sets. The Problem Solving subtest consists of 35 items which assess the students' ability to apply mathematical knowledge to solving numerical problems. Raw scores were analyzed statistically.

Grade 5

There were four subtests: (1) Computations, (2) Fractions, (3) Concepts and (4) Problems. The Computations subtest assesses the student's ability to add, subtract, multiply and divide whole numbers, denominate or non-denominate. The Fractions subtest

assesses the student's ability in the four basic operations using fractions, with mixed and with whole numbers. The Concepts subtest assesses the student's knowledge of mathematical concepts, including signs and symbols, measurement, number systems, money, geometry, and place values. The Problems subtest assesses the student's ability to perform simple, one-step and more complex word problems.

French Tests

Test de Rendement en Mathématiques

This test was developed and standardized by the C.E.C.M. for testing in its French schools. The grade 3 level of this test was administered to the grade 3 students and the grade 5 level to the grade 5 students. Each test consisted of 40 multiple-choice questions which assessed a variety of mathematical skills. Raw scores were converted to stanine equivalents for statistical analyses. This test was administered in November/December of 1976 in order to coincide with the C.E.C.M. standardized testing.

Date of Testing

With the exception of the Tests de Rendement, all tests were administered in May and June, 1977. The Tests de Rendement were administered in November/December, 1976.

RESULTS

Grade 3

All students in the grade 3 classes were tested on the Raven's Progressive Matrices Coloured Version (1956) last year in grade 2. This test is purported to measure non-verbal intelligence and is particularly suitable for testing young children because it does not require skill in reading. The results from this test were subjected to statistical analysis (least squares analysis of variance) using school group (Immersion Group 1, Immersion Group 2, Control) as the main variable. A significant difference was found among the school groups, indicating that the three groups were not exactly equivalent in terms of non-verbal intelligence. Since these differences in intellectual level could have influenced performance on the other tests in the current evaluation, it was decided to use analysis of covariance with the grade 2 Raven's scores being the covariate to analyse the results from the grade 3 tests. In all analyses, the main variable was school group (Immersion 1, Immersion 2, Control). Separate analyses (least squares solution) were performed on the results of each test. A summary of these results is presented in Table 2.

(1) English Language Tests

There were statistically significant differences between the school groups on two of the English language subtests -- Language and Spelling. In both cases, IS2 students scored lower than IS1 students and than CS students. It will be recalled that IS2

students had still not had English language instruction whereas IS1 students had 4 hours a week. There were no significant differences between the two Immersion groups and the comparison group on the Word Knowledge and Reading Comprehension subtests. Thus, the current results are consistent with findings in evaluations of regular early Immersion programs where only one second language is used (Genesee, 1977; Lambert & Tucker, 1972; Barik & Swain, 1977), insofar as the deficits in English language skills that IS1 students had in grade 2 were redressed after English language arts was introduced; this was true even in spelling. The IS2 students continue to show progress in English language skills development scoring at or slightly above grade level according to test norms on two of the subtests (Word Knowledge and Comprehension), but below grade level on the Language and Spelling subtests. IS1 and CS students scored above grade level, in the average stanine range, on all of the subtests. See Table 3 for a summary of the stanine and grade equivalent scores for the M.A.T subtests.

(2) French Language Tests

The results of the IS2 students on the Test d'Ecoute had to be eliminated from the analysis due to mechanical difficulties during presention of the test.

There were statistically significant differences between the school groups on the Test de Lecture, the Test d'Ecoute and on all five dimensions of the Oral Production evaluation. CS

scored significantly lower than IS1 on both the Test de Lecture and the Test d'Ecoute; furthermore, CS scored significantly lower than IS2 on the Test de Lecture. Further, CS students were rated significantly lower than IS1 and IS2 students on all five dimensions of oral production; there were no differences between IS1 and IS2 on any of these dimensions.

There were no significant differences between the groups on the Test de Rendement en Français. The failure to find differences on this test, in contrast to the findings on the other tests, may be attributable to the beginning-of-year testing date. Had the test been administered near the end of the school year, differences may have emerged. This speculation is supported by the Test de Lecture results which assess somewhat similar skills.

The results of this year's French language testing reveal an emerging tendency for the Immersion students to demonstrate superior proficiency in the French language. It will be recalled that these groups of Immersion students failed to demonstrate significantly better performance on most of the French language tests at the end of Grade 1 and that only by the end of Grade 2 was an advantage in French beginning to emerge, even this was characteristic of only IS2 students. Perhaps enhanced French language skills will emerge only after several years of participation in this type of program with its somewhat reduced exposure to the French language, relative at least to that offered by other regular, single language Immersion Programs.

(3) Hebrew Language Tests

There were significant differences between the groups on the Vocabulary test -- IS1 (M = 14.89) and IS2 (M = 15.50) scored significantly higher than CS (M = 13.53); there was no significant difference between the two immersion groups. Similarly, IS1 (M = 4.92) and IS2 (M = 4.63) scored significantly higher than CS (M = 2.60) on the Verb Tense test. An inspection of the frequency of error types on this test does not reveal a predominance of either type (see Table 2, item 10).

There were significant differences between the groups on the Sentence Comprehension and Paragraph Comprehension subtests. In the case of the Sentence Comprehension test, the two immersion groups scored significantly higher than CS (IS1 = 13.32; IS2 = 12.69; CS = 11.37); there was no significant difference between IS1 and IS2. There were significant group differences on Story 1 of the Paragraph Comprehension test -- IS1 scored significantly higher than CS; there were no other differences on this test. There were no differences between the groups on Story 2.

The only significant effect on the Oral Production test was on comprehension in which case IS1 (M = 4.79) and IS2 (M = 4.93) scored significantly higher than CS (M = 4.48). All three groups were rated comparably on the other four dimensions of this evaluation.

In general, the Hebrew language test results indicate that the two immersion groups were performing as well as or better than

the control group. This tendency has been noted last year in the Hebrew oral production results.

(4) Mathematics Tests

There were significant differences between the school groups on the Computations subtest of the Metropolitan Achievement Test. CS scored significantly higher than both IS1 and IS2; there was no significant difference between the two Immersion groups. There were no significant differences between the groups on either the Concepts subtest or the Problem Solving subtest. These findings are consistent with last year's results where it was found that IS2 scored lower on the grade 2 Computations subtest than the other two groups, but there were no differences between the groups on the Concepts and Problem Solving subtests.

A summary of the stanine and grade equivalent scores for this year's results is presented in Table 4. It is evident from these converted scores that all three school groups were scoring above grade level and in the top portion of the average stanine range (4-5-6). Thus, in general, these students' mathematics skills in English are quite comparable and, at the same time, superior to the standardization group. That the two Immersion groups should score lower than the Control group on the Computations subtest is somewhat puzzling if the reason for this difference is the fact of receiving math instruction in French -- one

would expect least difficult in achievement in this area since the verbal loading during computations is minimal.

There were no significant differences between the groups on the French mathematics test -- all groups scored in the "below average" stanine range.

Grade 5

All students in grade 5 had been administered the Canadian Lorge-Thorndike Test of Intelligence (1967) in grade 4. The results of the three school groups were compared statistically by means of analysis of variance and found not to differ significantly from one another. Therefore, the test results from the current evaluation were analyzed using analysis of variance (least squares solution) since it was felt that the influence of intelligence was adequately controlled by the compositions of the groups. The results of each test were analyzed separately. A summary of the analyses is presented in Table 5. It will be recalled that the grade 5 class from IS2 was not in fact following an Immersion program. Nevertheless, the name Immersion School 2 will be retained here to maintain continuity with the grade 3 labels. The comparisons of most interest here are between IS1 and IS2 and between IS1 and CS.

(1) English Language Tests

There were no statistically significant differences between IS1 and IS2 or between IS1 and CS on any of the subtests of the California Achievement Test. Further, with one exception, there

were no significant differences between the IS1 students and the other students on any of the six dimensions of the writing evaluation which were analyzed statistically. The one exception is "originality" where CS was rated significantly lower than IS1 and IS2. For the most part, the ratings of punctuation, length and vocabulary are comparable for all groups. It had been noted in last year's evaluation that the results of IS1 students on the Word Knowledge subtest were significantly lower than those of the other students; this difference was not evident this year. In addition, the teachers' ratings of the students' vocabulary in their compositions failed to indicate any appreciable differences. Nor were the somewhat lower ratings on punctuation and length which the IS1 students received last year evident this year. In sum, the writing skills of the Immersion students were rated at par with those of their non-immersion peers.

Thus, overall, the Immersion students demonstrated the same competencies in the English language as did the non-immersion students, a finding consistent with evaluations of regular French Immersion programs.

(2) French Language Tests

There were statistically significant differences between the school groups on all of the French language measures, including all five scales of the oral production evaluation. CS scored significantly lower than IS1 on every measure, and IS2 scored lower on all measures except two -- compréhension during the interview, and

prononciation; in these two cases, there were no differences between IS1 and IS2. There were no significant differences between CS and IS2 on any of the measures. It is worth pointing out that the IS1 students scored in the "average" stanine range (4 - 6) on the Test de Rendement en Français; the other two groups scored in the "below average" range (2 - 3).

In general, these results are very consistent with last year's findings.

(3) Hebrew Language Tests

There were significant differences between the school groups on the Vocabulary subtest -- IS1 and IS2 scored significantly higher than CS; there was no difference bewteen IS1 and IS2. On the Verb Tense subtest, IS1 scored significantly higher than IS2 and CS. An inspection of the frequency of error types for this subtest does not reveal a preponderance of either tense or pronoun errors; a similar finding was noted in the grade 3 results.

There were significant differences between the groups on the Comprehension (Cloze) test. CS students (M = 19.74) supplied significantly fewer correct fill-ins than either IS1 students (M = 32.57) or IS2 students (26.90); there was no significant difference between IS1 and IS2. Conversely, CS students (M = 10.00) used significantly more non-sense words than did either IS1 (M = 3.86) or IS2 (M = 5.05); again, there was no difference between IS1 and IS2. There were no significant differences in the response categories of gramatical errors or omissions.

Analyses of the oral production results indicate that CS was rated significantly lower than IS2 on three scales -- pronunciation, grammar and vocabulary, and significantly lower than IS1 on the pronunciation scale. Otherwise, there were no significant differences between CS and the other two groups or between IS1 and IS2.

As in the case of the grade 3 Hebrew results, these findings indicate that the Immersion students at School 1 were performing as well as or better than the non-immersion students in Hebrew.

(4) Mathematics Tests

There were no significant differences between IS1 and the other two groups on the Computations, Concepts or Problem Solving subtests of the C.A.T. However, IS1 did score significantly lower than CS on the Fractions subtest. The differences between IS2 and CS on the Computations and Fractions subtests are not of direct relevance to an evaluation of the Immersion program since the group is not following an Immersion program. Similar differences in Mathematics between IS2 and the other groups have been noted in previous evaluations. That both IS1 and IS2 scored lower than CS on the Fractions subtest suggests that this difference does not reflect the influence of Immersion per se; an alternative possibility consistent with these results is that the mathematics curriculum at CS is particularly strong in this area.

There were no significant differences between the groups on the Test de Rendement en Mathématiques -- all groups scored in the "average" stanine range.

DISCUSSION AND SUMMARY

The results of this year's testing in grade 3 indicate:

(1) In English, IS1 students had reached parity with the control students in all areas under evaluation, after one year of an English language arts program. IS2 students, who had still not received any instruction in English, lagged behind the two other groups in spelling and language but had reached parity on vocabulary and reading comprehension, thereby demonstrating good progress in the development of English language skills.

(2) In French, for the first time the two immersion groups demonstrated truly consistent superiority in French -- in reading, listening comprehension and oral production; one exception being performance on the Test de Rendement en Français.

(3) In Hebrew, the two immersion groups performed as well as or better than the control group.

(4) In Mathematics, IS1 and IS2 students scored lower than the Control students on the English Computations subtest; otherwise there were no significant differences on the English math tests. All groups scored at the same level on the French math test.

In conclusion, the grade 3 immersion students at both schools demonstrated superior skill in the French language; this is the first year that their French skills have been consistently better than those of the control students. The students at IS1, who were introduced to English language arts for the first time

in grade 3, made good progress in English, reaching parity with their peers in the control school. IS2 students who were still receiving all instruction in French were making good progress in English. There was no evidence that participation in the French immersion program had had adverse effects on the students' Hebrew language development; in fact, the Immersion students tended to out-perform the non-immersion students in Hebrew.

The results of the grade 5 testing indicate:

(1) In English, the immersion students demonstrated the same competence as the control students in all areas of English under evaluation, including vocabulary, reading comprehension, spelling, and writing.

(2) At the same time, the Immersion students demonstrated consistent superiority in the French language.

(3) The Hebrew language proficiency of the Immersion students was at the same level as or, in some instances, superior to that of the non-immersion students.

(4) Similarly, there was no evidence that the mathematics achievement levels of the Immersion students were adversely affected by participation in the program.

In conclusion, these results indicate no cause for concern and are quite consistent with this group's previous performance.

We will continue to monitor these groups of students as they advance through grades 4 and 6.

FOOTNOTES

1. This research was made possible by a research grant to the first author from the Office of the Secretary of State, Language Programmes Branch, Ottawa.

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3. We also express our appreciation to the Bilingual Education Project, O.I.S.E., for permission to use the Test de Lecture, 3e année, and to La Commission des Ecoles Catholiques de Montréal for permission to use the Tests de Rendement.

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TABLE 1

(A) SAMPLE SIZES

	Immersion School 1	Immersion School 2	Control School
Grade 3	23*	24*	27
Grade 5	14*	22	27

*Immersion Classes

(B) AMOUNT OF CLASSROOM INSTRUCTION** IN ENGLISH, FRENCH AND HEBREW

	English			French			Hebrew		
	ISI	IS2	CS	ISI	IS2	CS	ISI	IS2	CS
Grade 3	5	-	11	13½	17	9	13	13	13
Grade 5	8	10½	13½	11	8½	6	13	13	13

**Entries are calculated approximately in hours per week

TABLE 2

SUMMARY OF GRADE 3 TEST RESULTS [1]

		IS1	IS2	CS	F RATIO
1)	ENGLISH LANGUAGE TESTS				
	M.A.T.				
	1) Word Knowledge (50)	38.01	34.82	39.92	2.76[2]
	2) Reading Comprehension (45)	29.90	26.23	30.19	1.71
	3) Language (50)	31.38	24.05	34.33	12.04***
	4) Spelling (40)	28.13	19.29	31.57	12.22***
2)	FRENCH LANGUAGE TESTS				
	5) Test de Rendement en Français (9)	3.33	3.85	3.53	1.07
	6) Test de Lecture (28)	19.74	19.44	14.55	3.92*
	7) Test d'Ecoute (10)	6.57	-	5.00	12.36***
	8) Oral Production				
	Compréhension (5)	4.02	3.93	2.93	7.89***
	Prononciation (5)	2.80	2.59	1.50	9.21***
	Grammaire (5)	2.67	2.38	1.21	12.68***
	Vocabulaire (5)	2.44	2.08	1.40	6.12***
	Communication (5)	2.66	2.59	1.95	12.03***
3)	HEBREW LANGUAGE TESTS				
	READING				
	9) Vocabulary (17)	14.89	15.60	13.53	5.35**
	10) Verb Tense				
	Correct (10)	4.92	4.63	2.60	6.24**
	Pronoun Errors	2.45	2.18	3.32	
	Tense Errors	2.32	3.41	3.00	
	11) Sentence Comp. (15)	13.32	12.69	11.37	4.66**
	12) Paragraph Comp.				
	Story 1 (10)	8.33	7.58	6.20	3.17*
	Story 2 (12)	6.76	6.70	6.67	.00

TABLE 2 (continued)

	IS1	IS2	CS	F RATIO
3) HEBREW LANGUAGE TESTS (continued)				
13) Oral Production				
Comprehension (5)	4.79	4.93	4.48	5.70**
Pronunciation (5)	4.66	4.41	4.39	1.42
Grammar (5)	4.08	4.01	3.93	.38
Vocabulary (5)	4.16	4.12	3.81	1.66
Communicativeness (5)	5.00	4.87	4.86	1.40
4) MATHEMATICS TESTS				
M.A.T.				
14) Computations (40)	26.99	25.67	30.14	3.86*
15) Concepts (40)	25.90	27.31	27.78	.57
16) Problems (35)	23.75	23.92	24.65	.16
17) Test de Rendement en Mathématiques (9)	2.82	2.71	3.00	.22

*$p < .05$; **$p < .01$; ***$p < .001$; [2]$p = .07$

[1]Scores joined by a line differ significantly from one another according to the Newman-Keuls Multiple Comparisons procedure.

TABLE 3

SUMMARY OF STANINE AND GRADE EQUIVALENT SCORES

FOR GRADE 3 ENGLISH LANGUAGE TEST RESULTS

	Immersion 1		Immersion 2		Control	
	Stanine	Grade	Stanine	Grade	Stanine	Grade
Word Knowledge	5	4.4	4	4.1	5	4.8
Comprehension	5	4.5	4	3.9	5	4.5
Language	5	4.7	4	3.7	5	5.1
Spelling	4	4.1	3	3.3	5	4.6

TABLE 4

SUMMARY OF STANINE AND GRADE EQUIVALENT SCORES FOR GRADE 3 MATHEMATICS TEST (M.A.T.)

	Immersion 1		Immersion 2		Control	
	Stanine	Grade	Stanine	Grade	Stanine	Grade
Computations	6	4.3	6	4.2	7	4.7
Concepts	6	4.4	6	4.6	6	4.8
Problems	6	4.5	6	4.5	6	4.6

TABLE 5

SUMMARY OF GRADE 5 TEST RESULTS [1.]

1) ENGLISH LANGUAGE TESTS	IS1	IS2	CS	F RATIO
C.A.T.				
1) Vocabulary (40)	35.21	34.05	33.37	.49
2) Comprehension (42)	29.71	32.59	30.11	1.41
3) Capitalization (38)	27.15	27.82	28.04	.08
4) Punctuation 1 (30)	19.54	20.55	19.92	.15
5) Punctuation 2 (24)	12.31	14.55	13.35	.84
6) Usage (41)	27.79	28.00	25.85	1.51
7) Spelling (32)	22.00	23.59	24.15	.70
8) English Composition				
Spelling (5)	2.96	3.21	3.42	1.06
Sentence Accuracy (5)	2.71	2.95	3.02	.64
Sentence Variety (5)	2.86	2.95	2.92	.07
Organization (5)	2.79	2.98	2.98	.42
Originality (5)	2.43	2.26	1.92	5.34**
Overall (5)	2.82	3.05	2.96	.39
Punctuation				
Appropriate	10/14	15/21	21/26	
Inappropriate	4/14	6/21	5/26	
Length				
Appropriate	14/14	17/21	23/26	
Inappropriate	0/14	4/21	3/26	
Vocabulary				
Superior	0/14	0/14	0/26	
Average	14/14	20/21	22/26	
Poor	0/14	1/21	4/26	

TABLE 5 (continued)

	IS1	IS2	CS	F RATIO
2) FRENCH LANGUAGE TESTS				
9) Test de Rendement en Français (9)	4.18	2.63	2.16	18.96***
10) Test de Lecture (58)	39.07	30.81	31.30	31.04***
11) Test d'Ecoute (17)	14.64	10.38	8.15	6.14**
12) Oral Production				
Compréhension (5)	4.42	4.05	3.75	4.38**
Prononciation (5)	3.50	3.00	2.54	4.01*
Grammaire (5)	3.54	2.58	2.10	11.07***
Vocabulaire (5)	3.38	2.35	1.92	12.49***
Communication (5)	3.31	2.55	2.21	11.65***
3) HEBREW LANGUAGE TESTS				
READING				
13) Vocabulary (20)	18.86	16.80	13.22	10.35***
14) Verb Tense				
Correct (20)	13.21	9.45	7.83	6.84**
Tense Errors	3.71	4.14	5.00	
Pronoun Errors	2.57	3.23	4.82	
15) Comprehension				
Correct (46)	32.57	26.90	19.74	7.26**
Non-Sense	3.86	5.05	10.00	10.07***
Grammatical Errors	1.00	1.20	1.04	.11
Omissions	.43	1.50	.78	1.68
16) Oral Production				
Comprehension (5)	4.18	4.21	3.95	.83
Pronunciation (5)	4.05	3.97	3.43	4.12*
Grammar (5)	3.64	3.74	3.20	3.19*
Vocabulary (5)	3.55	3.68	3.14	3.09*
Communicativeness (5)	4.05	4.21	4.00	.40

TABLE 5 (continued)

4) MATHEMATICS TESTS	IS1	IS2	CS	F RATIO
C.A.T.				
17) Computations (48)	37.79	35.30	41.15	5.12**
18) Concepts (25)	19.71	19.67	20.96	1.23
19) Problems (15)	11.36	12.64	12.15	.99
20) Fractions (20)	11.50	10.64	14.33	6.89**
21) Test de Rendement en Mathématiques (9)	4.82	4.53	4.24	.50

*$p < .05$; **$p < .01$; ***$p < .001$

[1]Scores joined by a line differ significantly from one another according to the Newman-Keuls Multiple Comparison procedure.